Complete Summary

GUIDELINE TITLE

Evidence-based care guideline for pediatric constraint induced movement therapy (CIMT).

BIBLIOGRAPHIC SOURCE(S)

Cincinnati Children's Hospital Medical Center. Evidence-based care guideline for pediatric constraint induced movement therapy (CIMT). Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2009 Feb 16. 17 p. [45 references]

GUIDELINE STATUS

This is the current release of the guideline.

** REGULATORY ALERT **

FDA WARNING/REGULATORY ALERT

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

- August 3, 2009 - Onabotulinum toxin A (Botox/Botox Cosmetic), Abobotulinum toxin A (Dysport) and Rimabotulinum toxin B (Myobloc): The U.S. Food and Drug Administration (FDA) notified healthcare professionals of changes to the established drug names for Botox/Botox Cosmetic, Dysport and Myobloc to reinforce individual potencies and prevent medication errors, and provided recommendations for healthcare professionals to consider, plus information for patients, family members, and caregivers.

COMPLETE SUMMARY CONTENT

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SCOPE

DISEASE/CONDITION(S)

Unilateral upper extremity impairments associated with neurological conditions, e.g.,:

- Cerebral palsy
- Traumatic brain injury
- Brachial plexus injury

GUIDELINE CATEGORY

Counseling
Evaluation
Management
Rehabilitation
Treatment

CLINICAL SPECIALTY

Family Practice
Neurology
Nursing
Pediatrics
Physical Medicine and Rehabilitation

INTENDED USERS

Advanced Practice Nurses
Health Care Providers
Nurses
Occupational Therapists
Patients
Physical Therapists
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

- To improve upper extremity function of the affected arm in children with a unilateral upper extremity impairment
- To improve occupational performance in areas including (but not limited to) daily living skills, education, play, leisure, and social participation
- To improve the coordination and consistency of care provided by therapists
- To support the consistent use of outcome measures in order to evaluate the effectiveness of this treatment technique
- To communicate current evidence and treatment guidelines to physicians considering referral for constraint induced movement therapy (CIMT)
- To maintain and improve family satisfaction

TARGET POPULATION

Inclusions

Children over one year of age* with:

- Unilateral upper extremity impairments associated with neurological conditions (e.g., cerebral palsy, traumatic brain injury, brachial plexus injury)
- Caregiver able and willing to commit to the time required for daily procedure and follow-up care

*Constraint induced movement therapy (CIMT) is known to be used with infants at Cincinnati Children's Hospital Medical Center and throughout the country. However, adequate information on appropriate protocols and effectiveness of CIMT in infants is not available at this time. Therefore, infants under one year of age are excluded from this guideline.

Exclusions

This guideline is not intended for use with children with the following:

- Inability to participate in purposeful play or functional activity
- Contractures that limit functional arm use
- Referred for a constraint device only

INTERVENTIONS AND PRACTICES CONSIDERED

Evaluation/Counseling

1. Occupational therapy assessment including the use of standardized tools when appropriate
2. Timing of assessment relative to initiating intervention
3. Family education
4. Indications for referral

Treatment/Management

1. Duration and frequency of intervention
2. Methods of constraint (ace wrap, pedi-wrap, splint/glove, removable cast)
3. Development of a home program
4. Re-assessment following constraint induced movement therapy

MAJOR OUTCOMES CONSIDERED

- Upper extremity function
- Occupational performance

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

To select evidence for critical appraisal by the group for the update of this guideline, the Medline and the Cochrane databases were searched for dates of January 1990 to December 2007 to generate an unrefined, "combined evidence" database using a search strategy focused on answering clinical questions relevant to pediatric constraint induced movement therapy and employing a combination of Boolean searching on human-indexed thesaurus terms (MeSH headings using an OVID Medline interface) and "natural language" searching on searching on human-indexed thesaurus terms (MeSH headings using an OVID Medline interface) and "natural language" searching on words in the title, abstract, and indexing terms. The citations were reduced by: eliminating duplicates, review articles, non-English articles, and adult articles. During the course of the guideline development, some additional resources were identified through other authors' reviews of this subject. November 30, 2007 was the last date for which literature was reviewed for the current version of this guideline.

NUMBER OF SOURCE DOCUMENTS

20

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Recommendations have been formulated by a consensus process directed by best evidence, patient and family preference and clinical expertise. During formulation of these recommendations, the team members have remained cognizant of controversies and disagreements over the management of these patients. They have tried to resolve controversial issues by consensus where possible and, when

not possible, to offer optional approaches to care in the form of information that includes best supporting evidence of efficacy for alternative choices.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The guideline has been reviewed and approved by clinical experts not involved in the development process, distributed to senior management, and other parties as appropriate to their intended purposes.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Each recommendation is followed by an evidence classification identifying the type of supporting evidence. Definitions for the types of evidence are presented at the end of the "Major Recommendations" field.

Clinical Assessment

1. It is recommended that, for children not meeting the inclusion/exclusion criteria for this guideline, the referring physician be contacted to determine an alternative plan (Local Consensus & Expert, 2008 [E]).
2. It is recommended that in-depth education be provided to families prior to implementing constraint induced movement therapy (CIMT) to assist the families in understanding the commitment necessary for successful completion of the CIMT program (Adams & Drake, 2006 [O]).
3. It is recommended that only an occupational therapist that has training in CIMT theory, evidence-based practice (EBP) clinical guidelines, assessments, and development of home programming materials provide CIMT assessment and treatment (local consensus; United Cerebral Palsy Research & Education Foundation) (Local Consensus & Expert, 2008 [E]; Cerebral Palsy International Research, 2007 [E]).
4. It is recommended that an occupational therapy assessment be completed within one month prior to initiating CIMT (Local Consensus & Expert, 2008 [E]).

Note 1: The assessment may be part of the initial patient evaluation or may be completed during one or more treatment sessions for a child already receiving occupational therapy.

Note 2: Include standardized tools when appropriate for child's age (see the table below and Appendices 1-6 in the original guideline document).

Table: Recommended Measurement Tool by Age Group

Tests	1-2 Years	3 Years	4-7 Years	8-18 Years	Adults
Canadian Occupational Performance Measure (COPM) (Law et al., 2005 [X])	X Parent Report	X Parent Report	X Parent Report	X Client if Possible	X Client if Possible
Shriners' Hospital Upper Extremity Evaluation (SHUEE) (Pandyan et al., 2003 [X]; Bohannon & Smith, 1987 [X])	Â	X	X	X	Â
Manual Ability Classification System (MACS) (Eliasson et al., 2006 [X])	Â	Â	X	X	Â
Gross Motor Functional Classification System, Expanded & Revised (Palisano et al., 2007 [X])	X	X	X	X	X
Confidence Scale (Lorig & Holman, 2003 [X]; Holden, 1991 [X])	X	X	X	X	X

See Appendices 1-6 in the original guideline document for details of assessment tools.

Protocol Selection

5. It is recommended that the therapist engage in shared decision making and educate parents
    - In the details of the two CIMT treatment protocols described in the table below, presenting the evidence and discussing the risks and benefits of the different protocols (Adams & Drake, 2006 [O]; Campbell et al., 2001 [O]; Chen et al., 1999 [C]; Stenstrom, Arge, & Sundbom, 1997 [C]).
    - About the option of not implementing CIMT or waiting for implementation at a future date (Local Consensus & Expert, 2008 [E]).

      Note 1: The choice to not implement CIMT may be viewed as conservative management and is often difficult for families to choose (Elwyn & Charles, 2001 [O]).

      Note 2: "Clients who perceive that they are actively involved in treatment decisions generally have better outcomes" (Adams & Drake, 2006 [O]; Stewart & Brown, 2001 [O]; Greenfield et al., 1988 [A]).

Note 3: Parents may benefit from both verbal and written education about the two protocols. The companion document Constraint Induced Movement Therapy: Specialty Program contains a brief description of CIMT based upon this guideline that can be given to parents considering CIMT for their child.

Table: Protocols

Â	**Protocol 1 (Based on Eliasson et al., 2006)**	**Protocol 2 (Based on Willis et al., 2002)**
Duration of Intervention	8 weeks	4 weeks
Daily Constraint Wear	2 hours per day	24 hours per day
Daily Structured Practice with Caregiver	2 hours per day while wearing constraint	No additional practice required but 2 hours daily practice with caregiver encouraged
Method of Constraint	Ace Wrap Pedi-wrap Splint/Glove Removable Cast	Removable Cast
Frequency of Therapy	1 time per week	1 time per week

Method and Fabrication of Constraint

6. It is recommended, for parents who select Protocol 1, that the therapist try one or more methods of constraint with the child and parents to determine the least restrictive method that prevents the ability to grasp while allowing the child to use the arm for support (Local Consensus & Expert, 2008 [E]; Cerebral Palsy International Research, 2007 [E]).

   Note 1: Various constraints have been studied in the literature but there is insufficient evidence to support the use of a specific type (Hoare et al., 2007 [M]).

   Note 2: Protocol 1 is based upon the treatment model reported in Eliasson et al. 2005. The method of constraint was a "constraining glove" using a volar splint with thumb fixed against index finger inside of a cloth glove, with the goal of preventing "the ability to grasp" while allowing the child to "use the hand for support or for breaking a fall" (Eliasson et al., 2005 [C]).

   Note 3: In our experience, some young children do well with ace wrapping their unaffected arm or wearing a Pedi-wrap. However, some toddlers and children require a more robust constraint from which they cannot slip out. These children will likely benefit from a hand splint with a cover (a puppet or

sock) or a removable cast. Older children who are able to understand the reason for constraint use may be able to use less restrictive constraints such as ace wrap to the unaffected arm (Local Consensus & Expert, 2008 [E]).

7. It is recommended that the fabrication of removable casts for constraint be completed by occupational therapists with specific training in their fabrication (Local Consensus & Expert, 2008 [E]).

   Note: Cast fabrication is a skill that, done incorrectly, has potential to cause harm to the child's arm. In our experience, the risk of skin breakdown or discomfort is minimized when fabricated by therapists with training in fabricating casts for constraint (Local Consensus & Expert, 2008 [E]).

Frequency of Therapy

8. It is recommended that therapy sessions occur on a weekly basis throughout the CIMT program (Eliasson et al., 2005 [C]; Willis et al., 2002 [B]).

   Note: Treatment subjects in Eliasson 2005 (from which Protocol 1 is based) received weekly intervention with occupational therapists. Treatment subjects in Willis 2002 (from which Protocol 2 is based), "continued their routine visits to occupational and physical therapy (Willis et al., 2002 [B])." Children in the treatment group received an average of 1.4 therapy visits per week.

Treatment Sessions

9. It is recommended that treatment (both therapy sessions and structured practice with caregiver) be based on the following 3 principles (Eliasson et al., 2005 [C]):
   - Provide motivation to use the impaired hand by using the child's inner drive to play
   - Select activities of an appropriate level of difficulty so that child can be successful while developing new skills
   - Provide many opportunities for repetition

10. It is recommended that the treating therapist incorporate the following into each treatment session:
    - Update home program recommendations to guide structured practice with caregiver
    - Problem solve concerns with caregiver
    - Model interventions
    - Check fit and function of constraint, modifying if needed (Local Consensus & Expert, 2008 [E])

11. It is recommended that the treating therapist consider simultaneous use of other therapeutic techniques that may complement CIMT, being sure to note the use in progress notes (Local Consensus & Expert, 2008 [E]).

    Note: Research has not been conducted to assess the simultaneous use of other therapeutic techniques with CIMT. Our clinical experience suggests

considering the simultaneous use of orthoses, kinesiotaping, neuromuscular electrical stimulation, Botox, or other therapeutic interventions.

Parent Education/Home Program

12. It is recommended that a home program be developed and updated weekly to guide caregivers' daily structured practice with the child (Eliasson et al., 2005 [C]). Features of the home program include:
    - It is guided by the principles detailed in recommendation 9 (Eliasson et al., 2005 [C]).
    - It includes specific functional activities of interest to the family and child (Local Consensus & Expert, 2008 [E]; Novak, Cusick, & Lowe, 2007 [C]).
    - It focuses on one specific skill each week (e.g., grasp/release or shoulder flexion) (Local Consensus & Expert, 2008 [E]).
    - It picks five activities that target the chosen skill to be practiced during structured practice with the caregiver (Local Consensus & Expert, 2008 [E]).
    - It be provided in the form of an activity log to encourage daily follow through with program (Local Consensus & Expert, 2008 [E]).

Re-Assessment Following CIMT

13. It is recommended that re-assessment be conducted within 1 week following completion of the CIMT program, using the Canadian Occupational Performance Measure (COPM) and the Shriners' Hospital Upper Extremity Evaluation (SHUEE), in order to measure the outcome of CIMT with the child (Local Consensus & Expert, 2008 [E]; Law et al., 2005 [X]; Shriners, 2005 [X]).

Completion of CIMT

14. It is recommended that the therapist and the patient's caregiver reassess the child's need for continuing therapy services.

    Note 1: The plan for continued therapy will need to be individualized and may be influenced by family and patient's goals and interests, the therapist's assessment of potential for progress, and the department's Models of Therapy Guidelines and other policies (Local Consensus & Expert, 2008 [E]; Cerebral Palsy International Research, 2007 [E]).

    Note 2: A recent study found that children retained and further improved on the use of their affected limbs when parents follow through with at least 30 minutes per day of structured practice following CIMT intervention. (Taub et al., 2007 [B])

15. It is recommended that the therapist discuss with the family that repeated trials of CIMT may result in cumulative improvement (Charles & Gordon, 2007 [C]).

Definitions:

M: Meta-analysis or Systematic Review
A: Randomized controlled trial: large sample
B: Randomized controlled trial: small sample
C: Prospective trial or large case series
D: Retrospective analysis
O: Other evidence
S: Review Article
E: Expert opinion or consensus
F: Basic Laboratory Research
L: Legal requirement
Q: Decision analysis
X: No evidence

CLINICAL ALGORITHM(S)

The original guideline document contains clinical algorithms for:

- Constraint induced movement therapy (CIMT) -– new patient
- CIMTÂ -– established patient

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

References open in a new window

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of evidence is classified for each recommendation (see the "Major Recommendations" field).

M: Meta-analysis or Systematic Review
A: Randomized controlled trial: large sample
B: Randomized controlled trial: small sample
C: Prospective trial or large case series
D: Retrospective analysis
O: Other evidence
S: Review Article
E: Expert opinion or consensus
F: Basic Laboratory Research
L: Legal requirement
Q: Decision analysis
X: No evidence

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Improved upper extremity function of the affected arm in children with a unilateral upper extremity impairment

- Improved occupational performance in areas including (but not limited to) daily living skills, education, play, leisure, and social participation
- Improved coordination and consistency of care provided by therapists

POTENTIAL HARMS

Cast fabrication is a skill that, done incorrectly, has potential to cause harm to the child's arm. In the guideline developer's experience, the risk of skin breakdown or discomfort is minimized when fabricated by therapists with training in fabricating casts for constraint.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

These recommendations result from review of literature and practices current at the time of their formulations. This guideline does not preclude using care modalities proven efficacious in studies published subsequent to the current revision of this document. This document is not intended to impose standards of care preventing selective variances from the recommendations to meet the specific and unique requirements of individual patients. Adherence to this guideline is voluntary. The clinician in light of the individual circumstances presented by the patient must make the ultimate judgment regarding the priority of any specific procedure.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

Tools to assist in the effective dissemination and implementation of the guideline may be available online atÂ http://www.cincinnatichildrens.org/svc/alpha/h/health-policy/ev-based/default.htm.

IMPLEMENTATION TOOLS

Clinical Algorithm

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness
Patient-centeredness
Safety

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

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ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2009 Feb 16

GUIDELINE DEVELOPER(S)

Cincinnati Children's Hospital Medical Center - Hospital/Medical Center

SOURCE(S) OF FUNDING

Cincinnati Children's Hospital Medical Center

GUIDELINE COMMITTEE

Pediatric Constraint Induced Movement Therapy (CIMT) Evidence Based Practice Team

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All Team Members and Clinical Effectiveness support staff listed above have signed a conflict of interest declaration and none were identified.

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

The guideline was developed without external funding. All Team Members and Clinical Effectiveness support staff listed have declared whether they have any conflict of interest and none were identified.

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available from the Cincinnati Children's Hospital Medical Center.

Print copies: For information regarding the full-text guideline, print copies, or evidence-based practice support services contact the Children's Hospital Medical Center Health Policy and Clinical Effectiveness Department at HPCEInfo@chmcc.org.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

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